

Content beyond the Syllabus-MA6251

Vector Calculus can commonly be used in fluid Mechanics.

Differential equations are used in mathematical modeling, to analyze and understand a variety of real-world problems. Among the civic problems explored are specific instances of population growth and over-population, over-use of natural resources leading to extinction of animal populations and the depletion of natural resources, genocide, and the spread of diseases, all taken from current events. While mathematical models are not perfect predictors of what will happen in the real world, they can offer important insights and information about the nature and scope of a problem, and can inform solutions. It is also used to apply Exponential Growth – Population, Exponential Decay - Radioactive Material, Falling Object, Newton's Law of Cooling and RL circuit

Laplace Transforms are used to derive the circuit (differential) equations in the **time** domain, then transform these ODEs to the s -domain; and to transform the circuit to the s -domain, then derive the circuit equations in the s -domain (using the concept of "impedance"). Laplace transform use in nuclear physics. & electrical circuit theory. The concept of Laplace Transformation play a vital role in diverse areas of science and technology such as electric analysis, communication engineering, control engineering, linear system, analysis, statistics, optics, quantum physics, solution of partial differential operation, etc. In solving problems relating to these fields, one usually encounters problems on time invariants, differential equations, time and frequency domains for non –periodic wave forms. This paper provides the reader with a solid foundation in the fundamentals of Laplace transform and Fourier transform; and gain an understanding of some of the very important and basic applications of these fundamentals to electric circuits and signal design and solution to related problems.

This particular use of complex number algebra results in the generation of curvilinear networks Which allow orthogonal geometries to exist within curvilinear systems. The fact that these forms are all generated by mathematical functions means that complete smoothness and continuity are achieved bringing the advantages of increased precision to both drawing production and component fabrication. The applications for this method are potentially unlimited given the present state of computer technology, and the possibilities for form generation are stretched beyond the limits of pure manual techniques. Complex numbers are used in a number of fields, including: engineering, electromagnetism, quantum physics, applied mathematics, and chaos theory. Some fields of complex numbers are complex analysis, complex matrix, complex polynomial, and complex Lie algebra. Some applications of complex numbers are for representing AC Voltage which contains Potential as the real part and Phase angle as the imaginary part, it is also used to represent sinusoid ally varying signals in Signal analysis.